

MAY 25 1944

The
AMERICAN JOURNAL
of
MEDICAL TECHNOLOGY

Medical Library

MAY, 1944

Volume 10, No. 3

CONVENTION NUMBER

OFFICIAL PUBLICATION

(Copyright 1944)

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

Yearly Subscription, U. S. and Canada, \$2.50 (Foreign, \$3.00); Single Copy, 50c

Published Bi-Monthly by The Wines Printing Co., 4310 West Fort St., Detroit, 9 Mich.

Editorial and Business Office, 4310 West Fort Street, Detroit, 9 Mich.

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The AMERICAN JOURNAL *of* MEDICAL TECHNOLOGY

VOLUME 10

MAY, 1944

NUMBER 3

USE OF XENOPUS LAEVIS FOR PREGNANCY TESTING*

By LOUIS C. HERRING, M.T.

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Physicians and laboratory workers alike have for years sought a test for early pregnancy that would combine simplicity of technique, economy and accuracy. Many tests have been proposed but few have survived the test of time. The principal fault has been lack of specificity. Of the numerous tests that have been proposed the Aschheim-Zondek and Friedman have been the chief ones to attain wide acceptance and usage.

The newcomer to the field of pregnancy testing is the *Xenopus* Test.

The *Xenopus* seems to most nearly approach the ideal since it combines accuracy, speed and simplicity of technique.

Hogben in 1930 first demonstrated that extracts of the anterior lobe of the pituitary would cause external deposition of ova in mature female *Xenopus laevis*. Since the original observation of Hogben, his findings were corroborated by Charles and Slome, Shapiro, Zwarenstein and Bellerby.

Impressed by the reports of Bellerby, Shapiro and Zwarenstein,

*Award paper, June, 1943, American Society of Medical Technology, (Second Award).

Crew, at the Institute of Animal Genetics, University of Edinburgh, imported a number of the animals to investigate the possibility of developing a sensitive, speedy and accurate test for the presence of gonadotropic hormones in pregnancy urine, and it is to Crew that much of the credit must go for the development of the reaction into a workable test for pregnancy.

Weisman, Snyder and Coates, aided by a grant from the New York Biological Research Foundation, imported a number of the animals to the United States and conducted experiments to determine if the animal could be acclimated to the United States and successfully used in this climate for pregnancy testing. Their reports indicate that the animal is adaptable to climatic conditions of the United States and compares favorably in all respects, and in some respects is superior to, the Aschheim-Zondek or Friedman tests as a routine test for pregnancy.

It has been shown by the work of Crew, Weisman, Snyder and Coates that the *Xenopus* is as reliable as the rabbit or mouse as a test animal and that the animal can, and may entirely, replace the rabbit for pregnancy testing. Under the present conditions of specimen preparation, however, in certain cases the mouse must be retained for the reason that it possesses different but equally valuable qualities as a test animal. Both the Friedman and the *Xenopus* tests are rapid, requiring 24 to 48 hours in the case of the Friedman, and 4 to 18 hours in the case of the *Xenopus*.

Both the *Xenopus* and the Friedman are in the nature of an "all or nothing" response. The Aschheim-Zondek test, however, is a slow test, requiring five days for completion; but yields, with different hormone concentrations, a graduated series of reactions, from strongly positive through extremely weak to negative reactions. For this reason the mouse possesses very considerable advantage over the rabbit in respect to its usefulness when information other than the existence or non-existence of pregnancy is desired. These graduated reactions, in the case of the mouse, can demonstrate the difference between a normal hormone concentration and an abnormally low concentration in early pregnancy, and thus disclose the threat of imminent abortion. They may also differentiate between true pregnancy and the endocrine repercus-

sions of abnormal emotional states, and between pregnancy and menopausal conditions. The mouse is most useful, however, in that with it, it is possible to record the stages of retrogression of chorioneplithelioma and hydatidiform mole. So in these respects it may be seen that by use of the rabbit we have a fairly rapid qualitative test for increased hormone concentration in early pregnancy, whereas with the mouse we have a slower reaction and one which is quantitative.

In the *Xenopus* test we do have a rapid qualitative test which is in no respect inferior to the rabbit, and in many respects superior, but at the present lacking in the quantitative feature of the mouse.

Present trends of research, however, indicate that, with refinements in technique, the *Xenopus* may be discovered to possess this quantitative feature as well. At present this feature is not considered in evaluating the *Xenopus* test.

On the basis of over 3,000 reported cases with the *Xenopus* the accuracy is 99.6%, as compared with an accuracy of 96 to 98% with the Friedman. This is not a highly significant difference in accuracy but sufficient to suggest that it is at least the equal of the Friedman in this respect. In my own hands the *Xenopus* has yielded an accuracy of 96%, having yielded in 300 cases 12 negatives which clinical follow up proved to be errors.

In regard to the time element, 48 hours is the usual lapse of time between the injection and examination of the rabbit. In cases of extreme urgency when a report is desired as soon as possible, two animals may be injected and one sacrificed at 24 hours; should it be negative the other must be allowed to go the full 48 hours. With the rabbit it is not unusual for the reaction to be negative at 24 hours and positive at 48; so at least 48 hours must elapse before a definitely negative report can be rendered. Thus it may be seen that it is not possible to report a positive reaction at the moment it takes place but only at two intervals in the 48 hours. With the *Xenopus*, the reaction may be observed as early as 3 hours after injection and definitely reported negative after 24 hours. I have observed one reaction taking place at 3½ hours and had, in 300 cases, only one reaction take place after 18 hours, that one requiring 22 hours and being a case in which only one-third the recommended quantity of urine was submitted. In my observation,

only 3 cases have required longer than 12 hours to react, 2 of these being cases in which one-half to one-fourth of the recommended quantity of urine was submitted. The majority of the reactions in my observation have taken place between 6 and 12 hours after injection. Weisman states that the average time in his observation has been 8 hours. From these experiences it is apparent that the *Xenopus* possesses a distinct advantage over the rabbit in regard to rapidity of results.

Another advantage possessed by the *Xenopus* is that reactions are definitely positive or negative; there are no doubtful reactions. The animal either extrudes ova or she does not. The extrusion of the first egg indicates a positive. When the rabbit is used it is no rare occurrence to find that it is impossible to be certain that a given reaction is positive or negative, prompting the frequency of reports, "doubtful, suggest repeat."

The *Xenopus* is remarkably free from elements tending to produce false positives. Under laboratory conditions and in the absence of the male, the *Xenopus* has never been observed to ovulate spontaneously. Oviposition is induced only upon injection of anterior pituitary or anterior pituitary-like substances. Spontaneous ovulation in the rabbit can and does occur in the absence of the male without any kind of injection. For this reason, rabbits must be kept isolated and in quiet surroundings before use. The *Xenopus* requires no such care and can be taken straight from stock for the test. Each frog, however, must be tested to determine if it is capable of reaction. To be suited for pregnancy testing, the frog must react positively to an injection of 100 U of antuitrin S.

The cost of the test is an item to be considered. The usual cost of a Friedman rabbit is \$1.50 to \$2.50, depending on the availability of the animals and proximity to a source of supply; somewhat less if the animals are bred and the males sold for meat. However, unless a large number of tests are done, attempting to breed one's own rabbits is a very impractical venture. In a single test, the cost may range from \$1.50 to \$5.00. With the *Xenopus*, in my own case frogs have cost from \$6.00 to \$10.00, depending upon the availability due to scarcity as a result of shipping losses caused by the war, high insurance rates in transit from Africa, and

the usual high cost associated with scarcity. The importer however guarantees live delivery. This initial cost, however, is reduced on a per test basis by the fact that the animal will survive a number of tests. One author reports as many as 37 tests with one frog.

In the case of the rabbit and mouse where the animal is sacrificed, the average number of tests to be done in a certain period can be estimated and arrangements made for delivery of animals as needed without any provision for after care of the animals. With the *Xenopus*, a considerable stock of frogs must be maintained and cared for in order that the required number may always be ready for use when needed. After extruding ova in a positive test, the frog must be rested for four weeks before it is ready for use again. If the frog does not react it may be used after a rest period of one week. These used animals must be dated and kept each in separate aquaria and cared for until ready for use. So it can readily be seen that many more animals must be cared for than the number which are actually available for use at any one time.

Since the percentage of positives out of the total number of tests done may vary considerably in different services, it is difficult to estimate the number of frogs that must be maintained to do a given number of tests per day. Obviously, the greater the percentage of positives the greater will be the number of frogs that must be maintained. It has been my experience that when positives and negatives occur in relatively equal numbers, approximately 20 frogs must be maintained to do an average of 1 test per day. Under these conditions the average number of tests per day multiplied by 20 will provide an approximation of the number of frogs required. This figure, of course, may vary widely in different services.

Technical skill will have a considerable influence on the average cost per test. Until skill is acquired in injecting the frogs, technical losses must be expected. It can readily be seen that each such loss will exert a greater influence on the average cost per test than will the loss of a rabbit or mouse. With skill and experience the average cost per test should be easily kept below that of the Friedman, the only economic disadvantage being that a larger initial investment is required than is required for the Friedman.

Technically, the *Xenopus* has a marked advantage over the

rabbit and mouse in its simplicity of interpretation. With the rabbit, the animal must be killed and the ovaries examined; whereas, with the *Xenopus* all that is required is simple observation for the presence or absence of extruded ova. Such observation requires no skill, while at times a decision as to whether a rabbit has reacted may be a difficult one to make and one that requires a certain degree of skill and experience.

The actual injection of the frog is more difficult than either the rabbit or mouse. No skill is required to inject the subcutaneous tissue of a mouse's back and after a few trials the injection of the ear vein in the rabbit becomes a matter of relative simplicity. On the other hand, skill as well as experience is required to inject the lymph sac of the frog. To miss the ear vein in a rabbit may mean spoiling the test but to miss the lymph sac of the frog usually means the loss of the animal as well as failure of the test. A certain percentage of losses must be expected until this skill is acquired but once acquired will amply repay one for the losses.

The accommodations required for rabbits and mice is relatively cheap and simple; the labor involved in their care is light. For the frogs, however, individual aquaria must be provided, the water must be changed before and after each meal, they must be housed in a light and airy room and the temperature maintained at a fairly constant temperature of not less than 70° F. Even so, it would seem that the *Xenopus* has many advantages and few disadvantages as compared with the rabbit or mouse.

* * * * *

DESCRIPTION OF THE XENOPUS

The *Xenopus Laevis*, or African clawed frog, is indigenous to Africa, ranging from the Cape to Abyssinia. The animal is entirely aquatic in its habits, it rests floating on the water with the nostrils exposed and leaves the water only to change locality because of drouth or scarcity of food. The animals appear to stand confinement well, even in small aquaria, and they greedily snap up strips of liver or lean beef and stuff it into their mouths with their hands.

Taxonomically the animal is neither a frog nor a toad. Although referred to by some authors as a frog and by others as a toad, actually the animal belongs to neither of the sub orders, Bufonidae

or Ranidae. It is an aglossan, lacking a tongue and having its two eustachian tubes united in one median pharyngeal opening in the posterior portion of the palate. The animal is distinguished by the absence of a metatarsal spur. The tentacle is very short and the inner metatarsals carry a sharp claw. The animal is called by the Boers the "Plat Hand" or Flat Hand.

The larvae are produced with an unpaired circular ventral sucker. The tentacles begin to sprout on the sixth day and soon reach a great length, giving the tadpoles a curious appearance. The tadpoles have no trace of horny teeth; external gills project as low conical or lamellar processes from the first three bronchial arches, but so-called internal gills are not developed. The larvae hatch out within thirty hours after extrusion of the ova.

The adult female differs from the common species of frog and toad in that she constantly ovulates and carries the ova in her abdomen. The ova are extruded in natural life only after copulation with the male of the species. The *Xenopus* has never been known to extrude ova under laboratory conditions unless injected with hormones. The eggs are extruded singly and measure about 1.5 mm in diameter. The fertile ova soon swell to double that size. The infertile ova, however, soon decompose. Breeding the frogs in captivity has not been successful although attempts are being made to propagate the animals.

Weisman, Snyder and Coates showed that although pituitary extracts, equine gonadatropin (derived from pregnant mare's serum and consisting chiefly of the follicle stimulating factor) and human chorionic gonatropin (principally the leutinizing factor), were all capable of provoking the reaction; in human pregnancy urine the reaction is probably based on the excess of the leutinizing factor since at least ten times the dosage of follicle stimulating factor was required to produce the same reaction as a given amount of leutinizing factor.

The laboratory care of the animals while requiring a fair amount of care and attention, is not difficult and the animals appear to be quite hardy and adaptable to life in captivity. One author writes that one *Xenopus* has been kept in captivity for eleven years in a London zoological garden. However, it is doubtful if such longevity can be expected of an animal repeatedly used for testing.

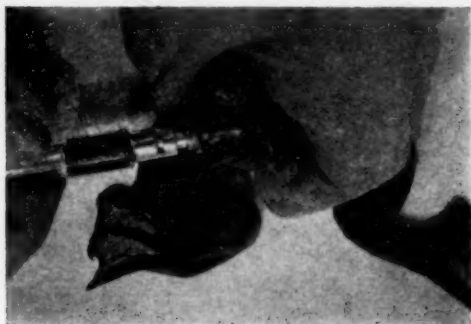
The frogs are kept in aquarium jars containing about six inches of water. I have found jars made by cutting off the necks of five-gallon water bottles very satisfactory. The frogs, ready for use, are kept in a twelve-gallon aquarium capable of accommodating from eight to ten frogs. If more than this number of frogs are kept ready for use additional aquaria should be provided.

After the frogs are injected they are placed in individual jars in which a rack of one-half inch mesh hardware cloth is elevated about an inch above the bottom. This precaution is necessary to prevent the frogs from devouring any of the extruded ova. When the number of extruded ova is large, frequently hundreds, this precaution appears unnecessary, but if only a few are extruded failure to take this precaution might result in error.

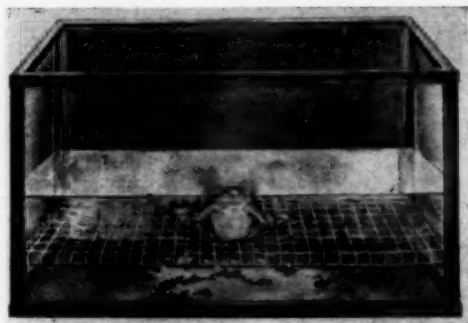
After the completion of the test, the animals are transferred to other jars and tagged with the date on which they will be ready for use again, allowing one week of rest for those which have not reacted and four weeks for those which have extruded ova. At the end of the normal resting period, these frogs are examined and if they appear to be ready for use they are then transferred to the "ready" tank. A frog, to be ready for use, should appear round and plump and the cloaca should appear bluish or dull reddish. A flat frog with a pale cloaca should not be used but should be returned to the resting jar and given extra feeding until it appears ready, upon later inspection.

The frogs are fed twice weekly by dropping finely chopped lean beef, heart or liver into the water. All fat and connective tissue should be carefully removed and the meat finely chopped or, in their greediness, the animals may choke themselves.

They should be housed in a light, well ventilated room and the temperature should be maintained at not less than 70° F. as stated elsewhere. Since the animals are cold blooded and their body temperature is governed by the temperature of the surrounding water, lower temperatures slow down the metabolism and may cause failure to react. The jars should be kept covered at all times with a tight fitting cover of wire or cotton mesh as the frogs are quite agile and may easily escape. Frogs which escape and are out of water for any length of time soon become dehydrated and die.



Improved method of injection. Small thin
needle inserted at right angle to mid-dorsal line.



Positive *Xenopus* reaction with pregnancy
urine.

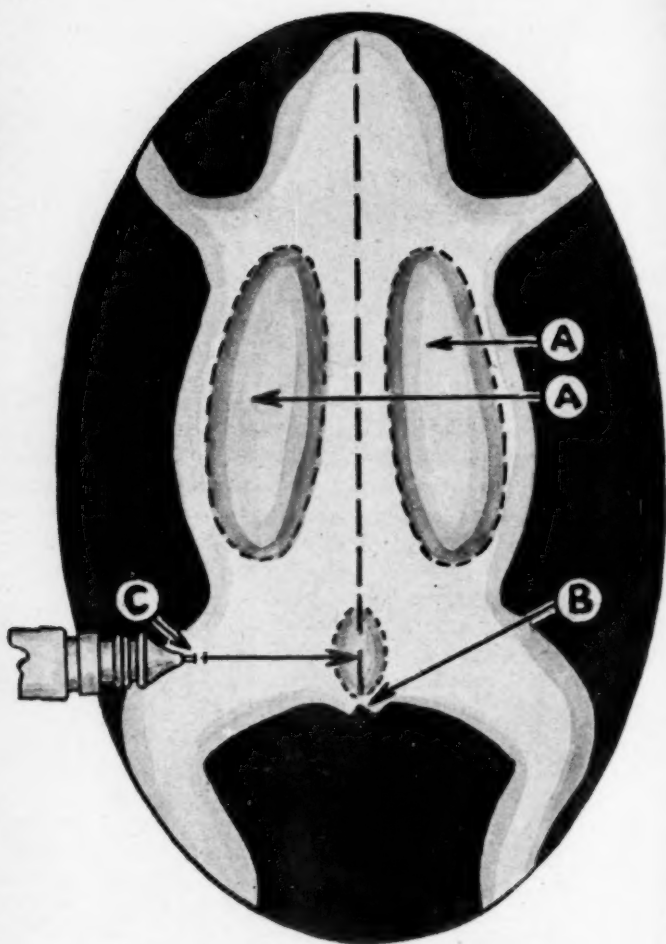


Figure 3. Diagrammatic illustration of lung anatomy and site of injection

(A) Lungs. (B) Cloaca. (C) Site of Injection.

Needle enters at Point C and is directed along course of arrow to midline.

TECHNIQUE OF TEST

Although whole urine or blood serum may be used, whole urine is not recommended because of the low hormone concentration and the possibility of toxic reactions. Blood serum is not recommended since urine is much more easily obtained. For the test at least four ounces of urine should be submitted. The first morning specimen is preferable since the hormone concentration is higher. The extract which is injected into the frog is prepared in the following manner:

Eighty cc. of filtered urine are acidified to litmus with glacial acetic acid, 160 cc. of acetone are added. The mixture is shaken vigorously and allowed to stand 15 minutes; this treatment precipitates the hormones and protein. The mixture is centrifuged and the supernatant is discarded or saved for recovery. The precipitate is washed with 2 changes of acetone or ether and recentrifuged. The precipitate is resuspended in a small amount of acetone and transferred to a small beaker (50 cc.) and allowed to dry thoroughly. Drying may be hastened by a current of air from a pump or fan. Swirling the suspension and allowing it to dry on the side of the beaker speeds up drying. Two cc. of distilled water is then added to the dry precipitate and the walls of the beaker carefully scrubbed down with a rubber policeman. The solution is then transferred to a centrifuge and centrifuged until perfectly clear. The supernatant is saved for injection and the precipitate of undissolved protein is discarded. By this treatment a concentrate is obtained which contains the hormone of 40 cc. of whole urine in each cc. One cc. of this extract is injected for the test. In cases of very early pregnancy or suspected ectopic pregnancy, the extract may be made to represent 80 cc. of whole urine but under no circumstances should more than 1 cc. of material be injected into the frog. Immediately prior to injection, the reaction of the extract is adjusted with 10% sulphosalicylic acid to approximately pH 5.5, using nitrazine paper (Squibb) as the indicator. The frogs appear to tolerate slightly acid material better than neutral or alkaline solutions. The concentration can usually be accomplished in about 30 minutes or less.

Using a long, slender needle and a one and one-half cc. syringe,

the material is injected into the dorsal (cranio-lumbar) lymph sac. I have found a one and one-fourth inch, 25 gauge needle very satisfactory.

The following method of restraint is quite helpful: the frog is placed on a firm table top on a folded towel and the corners of the towel folded over to wrap the front portion of the animal with the rear legs protruding, the cupped hand is placed over the wrapped frog with the index finger between the hind legs. Since the frogs are quite slippery this method of restraint makes the animals much easier to handle. The same thing may be accomplished by wearing a soft cotton glove on the restraining hand. The needle is thrust through the skin of the thigh and directed to the mid-dorsal line just above the cloaca. At this point a firm gentle thrust carries it through the connective tissue into the lymph sac. Great care must be exercised to keep the needle pointing upward and away from the frog to avoid puncturing the lung. Throughout its entire course the needle should be plainly visible beneath the skin. If the animal struggles the needle should be quickly withdrawn and the injection attempted again.

Technical loss of animals occurs only from lung puncture and toxic urines. Losses should be small if the urine is not contaminated and the technique familiar. Only clear concentrates should be injected. Anaphylaxis may occur in frogs injected with urines containing large amounts of albumin. Barbiturates are toxic. Abortifacient drugs may be toxic.

One particular point of caution must be mentioned: the extract must be free from the slightest trace of acetone; if not, the frogs immediately become coated with a film of tenacious mucus and almost invariably die. The injection should be alternated from one thigh to the other every two tests.

After injection the animals should be placed in separate jars and observed at intervals. Positives are evidenced by the extrusion of large numbers of macroscopic ova. Extrusion usually occurs between the fourth and twelfth hours after injection. The reaction should not be considered negative until 18 to 24 hours have elapsed. At the conclusion of the test the wire grids of the positive reactors should be burned off with a Bunson burner to avoid confusion in

subsequent tests from adherant ova. The animals are then transferred to resting tanks before use again.

SUMMARY

The history of the test is described; the comparative advantages of the test over the Aschheim-Zondek and Friedman tests are discussed; the technique of the test and care of the animals is described.

Conclusions:

1. The *Xenopus* is an accurate, reliable test animal for the hormones peculiar to pregnancy.
2. The test has the advantage of speed over other recognized tests.
3. The test compares favorably in cost to the Friedman.
4. The reactions are easily interpreted.
5. The animals are fairly easy to maintain.

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Acknowledgment to *Western Journal of Surgery, Obstetrics and Gynecology* and Abner I. Weisman, M.D., for the use of illustrations, Fig. 1, 2, 4.

L. C. H.

THE STORY OF THE KENNY METHOD

Just three and a half years ago—in 1940—a distinct change in our treatment of infantile paralysis was introduced, one that has since caught the public's attention because of its human drama. This was, of course, the method of treating infantile paralysis victims which was evolved by Sister Kenny, the Australian nurse.

Many have misunderstood the nature of the Kenny treatment, and have thought it a cure for infantile paralysis. That is not true, and Sister Kenny makes *no* such claim. There is *no* cure for this crippling disease. The medical profession is still in the dark as to how to prevent it. It cannot control its spread. No one yet knows by what method this virus is carried from one victim to another. In a day when we are masters of malaria, smallpox, and diphtheria—infantile paralysis is still a riddle, a mystery, a crippling menace prowling our country at will.

What Sister Kenny *has* contributed, however—and it is a very real contribution—is a method for treating victims already stricken by infantile paralysis; a method that in the opinion of many American doctors reduces the crippling after-effects of the disease.

There is a real interest in the history of the Kenny method in this country, and The National Foundation for Infantile Paralysis played an all-important part in evaluating this technique and in making it available to every infantile paralysis victim.

Sister Kenny went to the offices of the National Foundation one day in May, 1940, because she knew that the job of the National Foundation was to examine and study *every* new bit of knowledge that could possibly hasten the conquest of infantile paralysis. Present that day, were Sister Kenny, the President of the National Foundation and its Medical Director. Sister Kenny told how she had first developed her method. Thirty years ago, as a young nurse in the Australian bush country, without medical assistance she had to care for a child stricken with infantile paralysis. Instead of immobilizing her patient's paralyzed limbs in casts or splints, she worked out a method of easing the pain and tightness in the muscles by frequent applications of heat—strips of woolen material were wrung out of steaming hot water. As the

pain subsided she followed this with passive exercise until the patient himself could move his limbs. She felt that in many cases, this treatment had prevented many of the crippling after-effects of the disease.

Sister Kenny was anxious that the National Foundation subject her method to scientific check, and so was the National Foundation. A few weeks later, when the University of Minnesota asked the National Foundation to support a program to study the Kenny method, it readily made a grant to that institution to enable Sister Kenny to demonstrate her method, and to give the doctors at Minneapolis a chance to see her work. For the next six or seven months, Sister Kenny treated infantile paralysis patients in Minneapolis.

In January of 1941, the National Foundation received a preliminary report from the doctors at the University. They were strongly impressed by what they had seen. To be sure, the number of cases studied had been few—too few to justify definite conclusions, but the physicians supervising this study felt that the patients treated had made far better recoveries than was usual in their experience. They recommended further study.

There was one fact, not widely known, that made these doctors cautious in their judgment. And that was the fact that over 50 per cent of all infantile paralysis cases seemingly recover by themselves, without any special form of treatment! "How do we know," these doctors asked, "that many of these cases Sister Kenny has treated might not have been among those that would have recovered spontaneously?" Obviously no one could answer that question, but medical science and the National Foundation had to take that factor into account.

The caution of these doctors making their first study of the Kenny method was justified on other grounds, too. They had seen many hopeful methods for treating infantile paralysis tried before—methods which failed to stand up under scientific test. Before they gave the Kenny method their full approval, they had to be sure.

That is why in 1941, the National Foundation made a second grant to the University of Minnesota to make further studies of the Kenny method. Nearly one hundred patients were treated the following year. In December of 1941 the medical men of the Uni-

versity made a second report. After consideration of this report, the Medical Advisory Committee of the National Foundation declared:

"It is the opinion of this committee that during the early stages of infantile paralysis the length of time during which pain and tenderness are present is greatly reduced, and contractures caused by muscle shortening during this period are prevented by the Kenny method. The general physical condition of the patient receiving this treatment," said the committee, "seems to be better than that of patients treated by some of the other methods during a comparable period."

It was on the basis of this report that The National Foundation for Infantile Paralysis felt justified in opening the throttle and going full steam ahead to make this Kenny method of treating infantile paralysis available everywhere in the land. A plan was immediately set up to instruct and train doctors, nurses and physical therapy technicians. Sister Kenny herself was to help in the teaching at the University of Minnesota.

How well this has worked was clearly demonstrated during the epidemics of 1943 when 12,401 cases were reported. The doctors of the whole nation had learned something of the work; many were intimately acquainted with it. Physical therapy technicians and nurses had been trained to do the work. From the epidemic areas of the West, the Central States and the East came a flood of requests from physicians for more technicians and more nurses to give this treatment.

Here was proof of the endorsement of the method by American medicine! Patients could be treated from coast to coast. Private physicians, clinics, hospitals and departments of health called for more skilled workers. The supply was limited by the demands placed on this country by war; yet there were enough to do a good job.

Up to the present time, a total of 900 persons have received this training at the University of Minnesota alone, and have been graduated with the approval and certification of Sister Kenny.

All of this has been tremendously costly—a cost borne entirely by the National Foundation. To date, \$107,000 has been given

by the National Foundation to the University of Minnesota alone, to further the evaluation and teaching of the Kenny method. Every sum this University has ever requested has been granted in full by the National Foundation.

But the task of teaching the number of technicians needed to serve the whole country was too great for any one school. So the National Foundation opened other centers. Institutions in California, Illinois, Indiana, Georgia, Pennsylvania and New York took up the teaching of the Kenny method. In addition to the money given to the University of Minnesota, \$140,000 has been granted to the other schools. These grants were made to schools connected with or operated by medical teaching centers. Eight medical colleges and one hospital devoted solely to treating infantile paralysis and to training professional people took up the burden of making the special skills and knowledge available to all doctors, nurses and physical therapy technicians. There was no quarrel here between American medicine and new methods of alleviating suffering and crippling from infantile paralysis!

The National Foundation has spent additional money on scholarships, wool for treatment, distribution of literature, exhibits and demonstrations—a total of \$301,000!

In fact—and it is one worth remembering—in the past three years the National Foundation and its Chapters have spent a total of over *a half million dollars* of your money for the study and teaching of the Kenny method! It is no exaggeration to state that in all the history of medicine, few new theories have ever received such generous financial support from the people of any nation.

In addition to all of the foregoing, two five-year grants have been made recently by your National Foundation: one for \$175,000 to the University of Minnesota to study the physiological problems concerning the mechanism of infantile paralysis and methods of treatment; the other grant of \$150,000 was made to the University of Pennsylvania to establish a center for research and instruction in physical medicine. Both of these grants permit further evaluation and teaching of the Kenny method.

It is the dimes and dollars of the American people that have made this possible—the dimes and dollars they have contributed each year to the March of Dimes. And those dimes have done good

work. Last year, the third greatest epidemic in the recorded history of the disease in the United States struck our country. Had it not been for the hundreds of doctors, nurses and technicians trained with the public's money and ready to administer the Kenny method promptly, that epidemic might have resulted in a national disaster.

It is obvious, of course, that this newer type of treatment is far more costly, in money and personnel, than the older systems of handling polio victims. Heretofore, patients were usually immobilized in splints and plaster casts and could be cared for by a small staff of doctors, nurses and technicians. The physical therapy given usually consisted of a few hours of treatment a week—and that frequently was administered only late in the disease.

With the Kenny method, all that is different. Our medical men, in their own language, describe the Kenny method this way—"It is the early use of physical therapy, designed to prevent unnecessary deformities and to bring about the maximum function of such nerves and muscles as may have been spared by the disease process."

That means that each patient must have far more individual attention. Each case must have hot packs applied every hour or two for at least twelve hours of the day during the acute stages of the disease. At the same time, the passive exercise and re-education of the patient's muscles must be started. Just consider the personnel required to provide such care under epidemic conditions! Consider, too, the soaring cost of such treatment!

Progress is being made in the fight against infantile paralysis. The Kenny method definitely represents an important step forward in our treatment of this disease. But the fact that it *isn't* a cure and it isn't fully developed must be borne in mind.

There are some cases that can't be helped at the present time by any known method of treatment, whether it be the Kenny method or any other. These are the victims whose nerve cells have been completely destroyed by the ravages of the disease. To them, motion in some muscles has been denied forever. It is for these cases, particularly, that the research programs of the National Foundation, designed to find a way to prevent the disease, must go on.

Unfortunately, no one has yet been able to find a cure for infantile paralysis. Studies are constantly being pursued along this

line by the National Foundation, but so far without result. There is no known drug or serum or vaccine to combat the virus that causes the disease. But, in the meantime, both the amount and kind of palliative treatment have been improved.

How such treatment methods can be best taught and made available to the people is a matter about which there is a difference of opinion. The establishment of a Kenny institute in Minneapolis as the only place where the Kenny method would be taught has been suggested. But, of course, it's impossible to train all the Kenny technicians we require at any one place—in Minneapolis or elsewhere. And it would be equally impossible for any one person to supervise the various centers of teaching now supported by The National Foundation for Infantile Paralysis.

The ultimate aim is to make whatever is sound in the Kenny method a part of the curriculum of every medical, nursing and physical therapy school in the country—and that aim will be accomplished. No one institution can have a monopoly on the teaching of the Kenny method. While it is Sister Kenny's contribution to humanity, for humanity's sake it must be available to all.

This history of the Kenny method shows very clearly that *your* National Foundation stands ready to evaluate and test and make available *every* method of treatment that promises to loosen the grip that infantile paralysis has on our children. If, on the basis of tests made, a method is found effective, the full resources of The National Foundation for Infantile Paralysis will be thrown behind it. The *half million dollars* of your money spent on the Kenny method to date certainly proves that.

The National Foundation for Infantile Paralysis is *your* Foundation—a Foundation dedicated to one purpose and one purpose only—final and complete conquest of infantile paralysis.

Until that conquest is made, the National Foundation will carry on the most ambitious research program ever marshalled against any disease. It will also continue to provide hospitalization and medical care, including the Kenny treatment, in every community to every infantile paralysis victim who needs it. And it will continue to evaluate and aid every new method that is brought to its attention.

It is the people of *America* who have made all that possible!

INTER-AMERICAN NURSES TRAINING PROGRAM UNDER WAY

WASHINGTON—A great inter-American health and sanitation program in which the United States is cooperating with eighteen of the other American republics, has increased the demand for nurses and the demand is being met in large part by training additional personnel.

Training is being carried out mainly under special inter-American cooperative health services organized in the other American republics. The United States is contributing funds and technical aid to the program through the Institute of Inter-American Affairs, an agency of the Office of the Coordinator of Inter-American Affairs.

Many projects are under way or projected for the training of young women of the other hemisphere republics participating in the continental health program.

Dr. Janet Welch Mackie, specialist in tropical medicine, obstetrics, child health and nursing, who is with the health and sanitation division of the Institute, has surveyed the nursing needs of the other Americas. She recently returned from Bolivia, where she assisted the Servicio Cooperativo Inter-Americano de Salud Publica in developing a child health and nurses training program.

Reporting on the work, Dr. Mackie said:

"It is realized not only by the medical staffs of the Servicios, but by the local medical authorities, that one of the greatest handicaps to the development of public health activities is the lack of professionally trained nurses, particularly public health nurses.

"The Servicios, therefore, have attempted to promote nursing education to meet the needs as rapidly as possible. The training of public health nurses is a direct requirement to supply personnel for health centers now being established in many places in Latin America."

In Cochabamba, the Bolivian Servicio, through a public health nurse on its staff, is giving a home nursing course to a prominent

women's group interested in health problems. Practical nursing procedures are being taught in the maternity wards of the Cochabamba hospital.

To provide nursing personnel for the rising health centers of the republic, a public health nursing course was set up by the Servicio in La Paz. Nine of the best trained graduate nurses were selected for these health center posts. Three United States nurses are assisting in the organization of a school of nursing and hospital nursing service.

Existing nursing activities in Brazil are being enlarged and new ones established by the Servicio Especial de Saude Publica, or Special Public Health Service.

In Rio de Janeiro, where the inter-American health and sanitation program got its impetus from the recommendations of the third conference of American Foreign Ministers in January, 1942, United States nurses are helping in an advisory capacity. Two of these nurses are at work in the Ana Nery school of nursing, established by the Rockefeller Foundation. Hospitals in the Rio area are providing trainees with practice in medical and surgical nursing.

Post-graduate instruction also is being given to Brazilian nurses who plan to participate in training work in the Rio Doce Valley, a region of mining towns and thickly-populated rural areas where strategic materials are being produced for United Nations war effort.

The Rio Doce Valley has a medical care project designed to demonstrate the value of health centers and nurses training. The infant mortality rate in this area is high. A six months' course in practical nursing was started last July with sixteen students. The graduates will be assigned to Rio Doce Health centers.

A new nursing school is planned for Sao Paulo, to collaborate with the Faculty of Medicine and the new 1,200-bed Hospital de Clinicas. The Servicio is undertaking the construction of nurses' homes, classrooms and laboratories. The Rockefeller Foundation will aid in the curricula. The state government of Sao Paulo has asked the Servicio to provide two nursing instructors for the school.

Early in 1943 the Colombian government, assisted by the Servicio, organized a National School of Nursing at Bogota. Construction of residences, classrooms and laboratories is scheduled for completion in 1945. Meanwhile, the Servicio is remodeling a

building to house the first class of fifty girls. The Rockefeller Foundation is contributing to the maintenance of the school for five years. United States nurses appointed by the Pan American Sanitary Bureau are helping organize study courses. Colombian graduate nurses are being trained as instructors at the San Jose hospital.

In Ecuador, a National School for Nurses has been opened at Quito, the capital. This school is the result of cooperation among the Servicio, the Pan American Sanitary Bureau and the Rockefeller Foundation. It is organized under the direction of the Central University and the Ecuadoran ministry of labor, health and social welfare. These United States nurses are aiding the school. The school got its courses underway late in 1942 with twenty-nine students. It is equipped with living quarters, study bed-rooms, infirmary, laboratories and classrooms.

Four United States nurses associated with El Salvador's Servicio are assisting in the reorganization of the School of Nursing at San Salvador. Costa Rica's Servicio has been asked to supply nurses from the United States to aid in the reorganization of the nursing service in the 1,000-bed San Juan de Dios hospital at San Jose.

The Servicio in Honduras has established a six-months' course in practical nursing for home visits. Four girls who have completed training have been assigned to the new Choluteca health center and other Servicio projects.

At Managua, Nicaragua, the Servicio program of nurses training is being assisted by three United States nurses. A wing of a 70-bed hospital is being used as a training place for a class of 10 students.

In Paraguay, the government's school of nursing, in Asuncion, plans a reorganization with the assistance of United States nurses assigned by the Pan American Sanitary Bureau. Students in this school are to be trained in the 50-bed surgical section of the National Hospital de Clinicas. The Servicio has allotted funds to provide 75 scholarships.

Peru's Servicio has established practical nursing courses at hospitals in Iquitos and Tingo Maria. The hospital in the latter city, on the eastern slopes of the Andes, was the first such institution to be completed in the health and sanitation program. It gives Peruvian workers in this far outpost the benefit of modern health

facilities.

The hospitals were built by the Peruvian Servicio at a time when there was need for trained personnel in the area. United States nurses were brought in to help organize classes.

Another phase of the inter-American program is a fellowship plan for post-graduate study in the United States in nursing administration, public health and nursing education. Seven nurses from Brazil, Bolivia and Peru hold one-year nursing fellowships for study in the United States.

ABSTRACTS

THE VALUE OF DARK-FIELD EXAMINATION OF LYMPH NODES IN THE DIAGNOSIS OF EARLY SYPHILIS. A. B. Loveman & R. P. Morrow, *Am. Jr. Syph., Gon. & Ven. Dis.*, Vol. 28, No. 1, Jan. '44, p. 44.

After disinfecting the skin, a 20-22 gauge needle attached to a syringe containing 0.5 cc. sterile distilled water is inserted into the enlarged lymph node. The water is injected and the node slightly traumatized by moving the needle gently. Serum is then withdrawn and examined by dark-field methods. It was found that serum slightly blood tinged gave a higher percentage of positive results than clear serum.

The method is reported practical and easily carried out. In instances in which the primary lesion was healed or in which it was inaccessible, it was often possible to make the diagnosis from the lymph node and thus avoid the delay involved in waiting for serological reports. In 25 cases of syphilitic lymphadenopathy, *T. pallidum* was the only spirochete seen on darkfield examination and in 15 nonsyphilitic adenopathies no spirochetes were found.

DARK-FIELD EXAMINATION OF MATERIAL FROM LYMPH NODE PUNCTURE. Report of 2 Cases with no Evident Primary Lesions. O. F. Agee, *Am. Jr. Syph., Gon., & Ven. Dis.*, vol. 28 No. 1, Jan. '44, p. 57.

In this method 2 small drops of saline are placed on either end of a slide. A 20-gauge needle attached to an empty syringe is inserted vertically into the suspected lymph node. This is gently moved about a bit and, after waiting a minute or two, a small amount of material is forcibly aspirated. Usually the amount obtainable is so small it only fills the needle. This is forced out into one of the drops of saline and a transfer made to the second drop. This permits the observation of 2 different concentrations.

The procedure is advocated in instances in which lymph nodes persist near the site of infection after the primary lesion has healed.

CARBOL FUCHSIN IN PROPYLENE GLYCOL FOR RAPID STAINING OF THE TUBERCLE BACILLUS: A PRELIMINARY REPORT. T. G. Randolph & R. F. Mikell, *Am. Rev. Tuberc.*, vol. 49, No. 1, Jan. '44, p. 109.

The method described was found to agree with the Ziehl-Neelsen both in positive and negative instances. The advantages of the method are the elimination of the heating period, absence of precipitate on the slide permitting more rapid and complete decolorization, and the slide may be left in the stain varying periods of time without overstaining.

Stain solutions are made as follows: Solution A contains 1 g. basic fuchsin in 100 cc. propylene glycol. Solution B contains 5 g. of phenol in 100 cc. distilled water. These solutions are mixed in the proportion of 1 volume of A to 4 volumes of B. This is shaken vigorously a few seconds or until completely mixed. The solution appears to be stable.

MOLDS AND THEIR RELATION TO ALLERGY: By a Comm. of Allergists for the study of the Unknown Causes of Hay Fever and Asthma. *Ann. of All.*, vol. 1, No. 1, July '43, p. 54.

Collection of Samples: The Wells air centrifuge was used to collect air samples. Single spores were isolated by picking directly from a slide or by means of dilution plates.

Culture Methods: Maltose broth was discarded because the amount of broth adhering to the mold pellicle conveyed too much culture to the extract and also because, in as much as the pellicle grew in a water solution the active agent was already being extracted by the culture medium. Potato-dextrose agar plates were more satisfactory.

Extraction: Mold pellicles were desiccated by low temperature vacuum distillation. For most molds, 3 g. of pellicle were extracted with 100 ml. water. The water soluble portion was found to constitute 20-30% of the weight of the pellicle.

Skin Reactions: Positive skin reactions were obtained with *Fusarium*, *Helminthosporium*, *Cladosporium*, *Trichoderma* and *Alternaria*.

ELLIPTOCYTOSIS IN MAN ASSOCIATED WITH HEREDITARY HAEMORRHAGIC TELANGIECTASIA: J. B. Penfold & J. M. Lipscomb, *Quar. Jr. Med.*, vol. 12, No. 47, July '43, p. 157.

Red cells in this anomaly are predominantly elliptical in shape.

Cells of this type are characteristic of the non-mammalian vertebrates and the camelidae. Most of the cases reported have not shown anemia. Fewer have shown haemolytic anemia and in one instance, there has been polycythaemia.

Sternal puncture showed that the nucleated red cells of the bone marrow were round. The change in form occurs at approximately the reticulocyte level. The oval cells, when transfused into a normal individual, disappeared from the circulation faster than normal. There was no increase in fragility.

Elliptocytosis was inherited as a dominant character according to the laws of Mendel. Haemorrhagic telangiectasia also appeared as a dominant Mendelian character in the family reported.

RELATION OF THE LYMPHATIC GLANDS TO IMMUNITY AGAINST TUBERCULOSIS: M. C. Wilkinson & R. J. R. Cureton, *Lancet*, vol. 245, No. 6274, Nov. 27, '43, p. 662.

A study of 1,038 patients suffering from phthisis disclosed that only 32 (3%) showed evidence of a previous lymphadenitis. Of these, 27 had only a mild form of the disease. The average incidence for all individuals has been reported as 3.2%. Observation of the familial history showed that in the group that had had familial contact in childhood, only 43.5% developed a progressive phthisis in comparison with 61.3% of the group that had not had childhood contact.

EFFECT OF CERTAIN ORGANIC COMPOUNDS ON GERMICIDAL EFFICIENCY OF MERCURIC CHLORIDE: A. J. Salle & Y. W. Ginoza, *Proc. Soc. Exp. Biol. & Med.*, vol. 54, No. 1, Oct. '43, p. 85.

Staphylococcus aureus was the test organism. The carbohydrates, glucose, maltose and sucrose did not affect the germicidal efficiency of mercuric chloride. Proteins, protein split products and amino acids, however, did inactivate mercuric chloride. The degree of inactivation was parallel to the number of free amino groups present.

NEWS AND ANNOUNCEMENTS

ANNUAL SESSION

American Association of Medical Technologists

June 10, 11, 12, 1944

Chicago, Ill.

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Committee Chairmen for the Chicago Meeting

Program, Loretta Laughlin; Exhibits, Cecelia Kortuem; Local Arrangements and Entertainment, Louise Vance; Nomination, Henrietta Lyle; in charge of arrangements for Catholic Sisters, Sister Mary Laughlin; Chairman of Awards Committee, Olga Nelson.

EXHIBITS JUNE SESSION

Word has been received from C. Kortuem, M.T. (A.S.C.P.), chairman of Exhibit Committee, that several early promises have been made for Scientific Exhibits and demonstrations, one of which will be of special importance this year as it consists of a complete set of slides and specimens of tropical diseases. This should prove most interesting and instructive to members and guests attending the Annual Meeting of the Society, June 10, 11 and 12th.

The Exhibit Committee is anxious to catalog all prospective exhibits for the June Session of the American Society of Medical Technologists and to be informed of the intentions of those who plan to be in Chicago for the dates of the convention. Write at once to C. M. Kortuem, M.T. (A.S.C.P.), 721 N. LaSalle Street, Chicago 10, Ill.

COMMITTEE MEMBERS—LOCAL ARRANGEMENTS

The Arrangements Committee has submitted a brief outline in tentative form for entertainment at the June session in Chicago. Feeling that our members will be interested in this phase of the program, they submit the following:

Saturday

Noon—Lunch at Huyler's.

Night—A movie and lecture on malaria. (Arranged by C. M. Kortuem.)

Sunday

Night—Dinner at an interesting restaurant or Radio Broadcast (Program to be selected later).

Monday

Noon—Time open for guests to visit exhibits at A.M.A. Convention.

Night—Banquet at the Medinah Club.

Members of the Committee: Louise Vance, Chairman; Edith Barton, Robert Jenkins and Sister Mary Laughlin. Sister Laughlin will be in charge of housing and entertainment for the Sisters. Address: 6337 South Harvard, St. Bernard's Hospital, Chicago, Ill.

Send room reservations, including reservations for Sisters, to Louise Vance, M.T., 105 S. York St., Elmhurst, Ill.

"MEDICINE AND THE WAR" NUMBER,
MISSISSIPPI VALLEY MEDICAL JOURNAL

The April issue of the *Mississippi Valley Medical Journal* (Quincy, Ill.), is entirely devoted to "Medicine and the War," and contains the papers read at a symposium of this title given at the Ninth Annual Meeting of the Mississippi Valley Medical Society held last fall. There are formal papers by Paul B. Magnuson, M.D., Prof. of Bone and Joint Surgery, Northwestern University; Warren H. Cole, M.D., Prof. of Surgery, University of Illinois; Carl

M. Peterson, M.D., Secretary, Council on Industrial Health, American Medical Assn.; Charles H. Phifer, M.D., Chairman, 6th Service Command, Procurement and Assignment; Captain H. L. Dollard, M.C., U. S. Navy, and Colonel Don G. Hildrup, M.C., U. S. Army. There are also short statements by Surgeon General Thomas Parron, U. S. Public Health Service; Surgeon General Norman T. Kirk, M.C., U. S. Army; Brig. General Fred W. Rankin, U. S. Army, and James E. Paullin, M.D., President, American Medical Association.

CIVILIAN DEFENSE VOLUNTEER OFFICE, NEW YORK CITY

Because it is essential for the quick winning of the war that every man, woman, and child be on the constant alert against enemy sabotage, the CDVO of Greater New York, in cooperation with the Army, Navy, and FBI, is sponsoring "Safeguarding Military Information," a campaign to put you on your guard.

The enemy, with agents in all sorts of unexpected places, such as near the scene of an accident, at your office, in a home to which you are called, at an open meeting of your association or club, has its ears constantly open for even seemingly innocent bits of information about the fighting forces. Piecing little bits together is a precision art with them.

To be on the safe side . . . to safeguard all military information . . . to think first, before you spread the word that may mean death to our men and destruction to our plans.

When your patients become talkative, remind them, too! No one can be hurt by things left unsaid.

Minnesota

The Center of Continuation Study at the UNIVERSITY OF MINNESOTA is offering a *Continuation Course in Medical Technology*, Monday, Tuesday and Wednesday, May 15, 16, 17, 1944. Daily sessions start at 8:30 A.M. and 1:30 P.M. The program will include parasitology, hematology, bacteriology, immunology and chemistry. In fact the ologies are stressing diseases of military significance. Two-thirds of the time will be devoted to prevailing tropical diseases, including malaria. Dr. W. A. Riley, famous

parasitologist, will head this section of the program.

Registration is \$2; tuition is \$3, total, \$5.

Rooms, meals, and classrooms are again available at the Center for Continuation Study. Out-of-town residents are urged to use this facility as there is a shortage of hotel accommodations elsewhere.

On Sunday, May 14, 1944, the Medical Technologists of the State of Minnesota Society will assemble in convention at which time they will conduct their annual business meeting and conclude it with a scientific program, in St. Paul, Minnesota, where the Minnesota Hospital Association convenes at the same time. This convening with the hospital association is traditional for the medical technologists as they are one of the eleven or more allied organizations that assemble to discuss hospital problems in conjunction with the superintendents and administrators of hospitals of the state.

The Membership Committee has functioned well this year. Forty-four new members were added to the society, 8 reinstated making the census 136 of active members in the society.

North Dakota

A State Society of Technicians has not been organized. This information was kindly submitted by Mrs. W. C. Ashland Nichols, M.T. (A.S.C.P.), 1449 South 10th Street, Fargo, N. D.

Oklahoma

Dr. Donald B. McMullen, Assistant Professor of Preventive Medicine and Public Health at the University of Oklahoma, Medical School, has been conducting weekly lectures in Tulsa on "Parasitology." The course consisted of one hour of lecture and two to three hours of laboratory studies.

The Tulsa Round Table of Medical Technologists have been contributing to the war effort by preparing plasma for use in emergency by the OCD. Their quota last spring was one hundred pints and replacements are being prepared now.

Officers for the Oklahoma Society of Medical Technologists for 1944: President, Marie Clark, Osler Bldg., Oklahoma City, Okla.; Vice-President, Homer Spencer, 521 N. Boulder, Tulsa, Okla.; Recording Secretary and Treasurer, Mary Sherry, Wesley Hospital,

Oklahoma City; Corresponding Secretary, Leilla Woodworth, 604 S. Cincinnati, Tulsa; Advisory Board, Hazel Clay, Lucille Wallace, Elizabeth Park. Installation of officers is in January and the fiscal year runs from January 1st to December 31st.

Virginia

Tidewater Society of Medical Technologists has discontinued meetings and all group activities for the duration. This information was kindly submitted by Mary L. Macon, M.T. (A.S.C.P.), 413-17 Medical Arts Building, Norfolk, Va.

INLAND EMPIRE SOCIETY OF MEDICAL TECHNOLOGISTS

Not affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

1944

Regular meeting: Annual.

January.

OFFICERS

Frances Premo, M.T. (A.S.C.P.).....	President
Naomi Vogel, M.T. (A.S.C.P.).....	Vice-President
Lenore De Vor.....	Secretary-Treasurer

East 547 Gordon, Spokane, Washington.

Activities of this society are being held in check until Victory is Won.

NIAGARA FRONTIER ASSOCIATION OF MEDICAL TECHNOLOGISTS

Affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

1943-1944

Regular meetings: Monthly. 2nd Tuesday of month. October-June.

OFFICERS

Wilma Riehle, M.T. (A.S.C.P.).....	President
Mrs. Elfrieda Fendt Sicari, M.T. (A.S.C.P.).....	President Elect '44
Clara Hill, M.T. (A.S.C.P.).....	Recording Secretary
Mrs. Beatrice Allison, M.T. (A.S.C.P.).....	Treasurer
Mrs. Angela Auer, M.T. (A.S.C.P.).....	Corresponding Secretary

16 Duerstein Avenue, Buffalo, New York

OHIO SOCIETY OF CLINICAL LABORATORY TECHNICIANS, DISTRICT No. 1

Not affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
1944

Regular meetings: Semi-annual.

Fall and Spring.

OFFICERS

Jean Jones, M.T. (A.S.C.P.).....President

Ruth Koons, M.T. (A.S.C.P.).....Vice-President

Patricia Nelan, M.T. (A.S.C.P.).....Treasurer-Secretary

c/o City Hospital, Akron, Ohio.

New officers of this organization assume responsibilities in the fall of the year.

The above information was kindly submitted by Martha Cochran Wallace, M.T. (A.S.C.P.), c/o City Hospital, Akron, Ohio.

OKLAHOMA SOCIETY OF MEDICAL TECHNOLOGISTS

Affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
1944

Regular meetings: Semi-annual.

June and October.

OFFICERS

Marie Clark, M.T. (A.S.C.P.).....President

Homer Spencer, M.T. (A.S.C.P.).....Vice-President

Mary Sherry, M.T. (A.S.C.P.).....Recording Secretary-Treas.

Hazel Clary, M.T. (A.S.C.P.).....Director

Lucille Wallace, M.T. (A.S.C.P.).....Director

Elizabeth Parks, M.T. (A.S.C.P.).....Director

Leilla Woodworth, M.T. (A.S.C.P.).....Corresponding Secy.

604 S. Cincinnati, Tulsa 3, Oklahoma.

THE PENNSYLVANIA SOCIETY OF MEDICAL TECHNOLOGISTS AND LABORATORY TECHNICIANS

Affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

Resume of Programs up to Date

Sept. 13, 1943—"False Positive Wassermans Due to Smallpox Vac-

- cine." Dr. Grant O. Favorite, Pathologists, Hahnemann Medical College and Hospital.
- Oct. 11, 1943—"How to Adapt the Photoelectric Colorimeter to Clinical Laboratory Methods," John G. Reinhold, Ph.D., Dept. of Public Health, Philadelphia General Hospital.
- Nov. 8, 1943—"Microbiological Methods in Laboratory Analysis." Dr. Lemuel D. Wright, Research Staff, Sharpe & Dohme. Also "Recent Advances in Wound Healing." Dr. Lawrence W. Smith, Professor of Pathology, Temple University School of Medicine.
- Dec. 13, 1943—"The Reticuloendothelioses." Dr. Max Strumia, Pathologist, Bryn Mawr Hospital. Also "Complement Fixation Test in Virus Diseases." Dr. Bettylee Hampil, Research Staff, Sharpe & Dohme.
- Jan. 10, 1944—"Onchocerciasis." Dr. Hunter S. Cook, Associate Professor of Pathology, Hahnemann Medical College and Hospital.
- Feb. 14, 1944—"The Clinical Value and Limitations of the Electrocardiogram." Dr. Lowell L. Lane, Associate Professor of Medicine, Hahnemann Medical College. Also "Significance of Plasma Proteins in Health and Disease." Dr. Frank W. Konzelmann, Professor of Clinical Pathology, Temple University School of Medicine, Philadelphia.
- March 13, 1944—"Hormones and Tumors." Dr. Stanley Reimann, Director of Research Institute, Lankenau Hospital, Philadelphia. Also "The Morphochemic Classification of the Granulocytes of the White Blood Cells." Dr. Walter J. Crocker, Philadelphia General Hospital.
- April 10., 1944—"Demonstrations and lectures at the Graduate Hospital of the University of Pennsylvania. Speakers: Dr. H. E. Morton, Medical School of the University of Pennsylvania. Dr. B. L. Coffin, Veterinary School, U. of P., Dr. Sandra Nemser, Blood Donor Service, American Red Cross. Dr. Herman Beermen, University Hospital. Dr. C. P. Brown, Penna. Dept. of Health.
- May 8, 1944—Business Meeting and Election of New Officers and Installation.
- June 10-12, 1944—On to Chicago to attend the Twelfth Annual

Meeting of the American Society of Medical Technologists.
Submitted by the Chairman of Program Committee, Ellen Marie
McDevitt, M.T. (A.S.C.P.), 1101 N. 63rd St., Overbrook, Phila-
delphia 10, Pennsylvania.

TULSA ROUND TABLE OF MEDICAL TECHNOLOGISTS
Not affiliated with
AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

(Tulsa Round Table is affiliated with the Oklahoma Society of
Medical Technologists, which is affiliated with the A. S. M. T.)

1944

Regular meetings: Bi-monthly

OFFICERS

Oscar Stewart, M.T. (A.S.C.P.).....	President
Caroline Bower, M.T. (A.S.C.P.).....	Vice-President
Lythene Vermillion, M.T. (A.S.C.P.).....	Secretary-Treasurer

Hillcrest Memorial Hospital, Tulsa, Oklahoma.

New officers are installed in September.

WISCONSIN ASSOCIATION OF MEDICAL
TECHNOLOGISTS

Affiliated with

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

1944

Regular meetings: Semi-annual.

Fall and Spring.

OFFICERS

Alice A. Thorngate, M.T. (A.S.C.P.).....	President
Sr. M. Corona Rohlik, M.T. (A.S.C.P.).....	Vice-President
Grace Ballard, M.T. (A.S.C.P.).....	Treasurer
(Mrs.) Elizabeth Kullman, M.T. (A.S.C.P.).....	Secretary

2460 South 59th Street, Milwaukee, Wisconsin.

The Spring meeting of the Society will be held in Chicago, Illi-
nois, during the Tri-State Hospital Assembly, May 10th and 11th,
1944.

Miss Margaret Deshur, M.T. (A.S.C.P.); Chairman of Pro-
gram, c/o Mt. Sinai Hospital, Milwaukee, Wisconsin.

NEW! Rapid Sulfonamides Test Kit

for Determining Free Sulfonamides in Blood,
Spinal Fluid and Urine

- No Filtrations Required
- Only 0.2 ml Specimen Required
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Reference

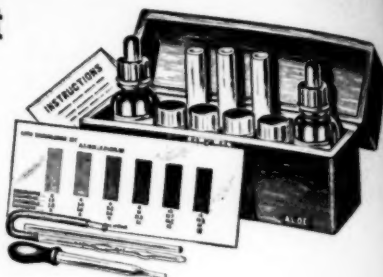
A. Goth, "A Simple Clinical Method for Determining Sulfonamides in Blood," *Journal of Laboratory and Clinical Medicine*, Vol. 27, No. 6, March 1942.

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The AMERICAN JOURNAL *of* MEDICAL TECHNOLOGY

JULY, 1944

Vol. 10, No. 4

OFFICIAL PUBLICATION

(Copyright 1944)

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS

Yearly Subscription, U. S. and Canada, \$2.50 (Foreign, \$3.00); Single Copy, 50c

Published Bi-Monthly by The Wines Printing Co., 4310 West Fort St., Detroit, 9 Mich.

Editorial and Business Office, 4310 West Fort Street, Detroit, 9 Mich.